

Prospects for studies of comets by the World Space Observatory Ultraviolet project

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Abstract

The World Space Observatory Ultraviolet (WSO-UV) [1], an international mission with Russia and Spain as the main contributors, consists of a 1.7m telescope with an imaging camera, two spectrographs in the range of 115-176 and 174-310 nm with a resolution of $R = 50,000$ for high resolution spectral observations and a long-slit-spectrograph for $R=1,000$ observations.

1. Introduction

The main scientific topics addressed by the project (included in the basic program) can be briefly summarized as follows:

- the baryon component of the Universe, the thermal and chemical evolution of the Universe;
- the formation and evolution of our Galaxy, the interaction of gas and stars, and the influence of magnetic fields on star formation;
- the physics of accretion and matter outflows;
- atmospheres of planets (exoplanets);
- the origin and physical evolution of comets.

The ultraviolet (UV) spectroscopy of comets at 110–320 nm wavelengths is a powerful tool of research, because this range of the electromagnetic spectrum contains the majority of resonance lines of atoms, molecules, and ions [2]. Due to the opacity of the Earth's atmosphere, such research can only be performed with space observatories. The World Space Observatory — Ultraviolet (WSO-UV) mission, planned for launch in 2023, will allow most of the challenges to be overcome in the UV studies of comets and will be able to become an essential research tool. Observations in the UV range are extremely necessary, because most astrophysical important resonant lines of atoms (O I, C I, H I, etc.), molecules (CO, CO₂, OH, etc.) and their ions lie in this range. In order to solve some of the problems, the UV data need to be complemented by ground-based observations.

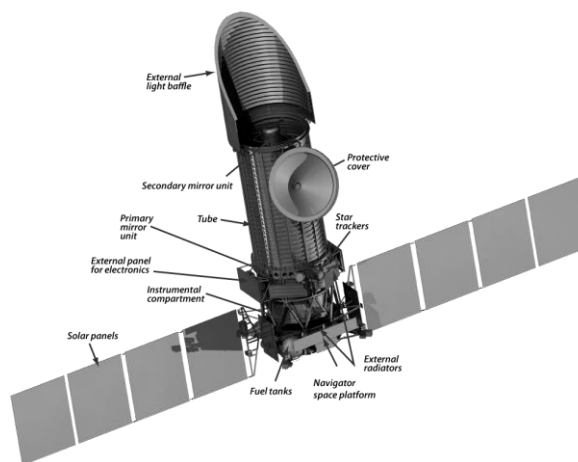


Figure 1: WSO-UV observatory model.

2. Conclusions

The information about the WSO-UV project is published at the website: <http://wso-uv.org>.

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